$2.50

Simpson®

INSTRUMENTS THAT STAY ACCURATE

OPERATOR'S MANUAL

SIMPSON 2750-2
STRIP CHART RECORDER

WARNING

For safe usage, it is essential that the operator read this manual carefully before using the instrument for any measurements.

SIMPSON ELECTRIC COMPANY
A Katy Industries Subsidiary
853 Dundee Avenue, Elgin, Illinois 60120
(312) 697-2260 • Cable SIMELCO • Telex 72-2416
IN CANADA: Bach-Simpson, Ltd., London, Ontario
IN ENGLAND: Bach-Simpson (U.K.) Ltd., Wadebridge, Cornwall

Warranty

SIMPSON ELECTRIC COMPANY warrants each instrument and other articles of equipment manufactured by it to be free from defects in material and workmanship under normal use and service, its obligation under this warranty being limited to making good at its factory any instrument or other article of equipment which shall within 90 days after delivery of such instrument or other article of equipment to the original purchaser be returned intact to it, or to one of its authorized service stations, with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on its part, and SIMPSON ELECTRIC COMPANY neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sale of its products.

This warranty shall not apply to any instrument or other article of equipment which shall have been repaired or altered outside the SIMPSON ELECTRIC COMPANY factory or authorized service stations, nor which has been subject to misuse, negligence or accident, incorrect wiring by others, or installation or use not in accord with instructions furnished by the manufacturer.

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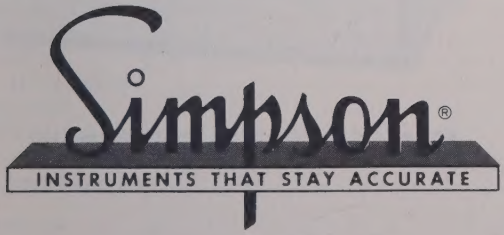

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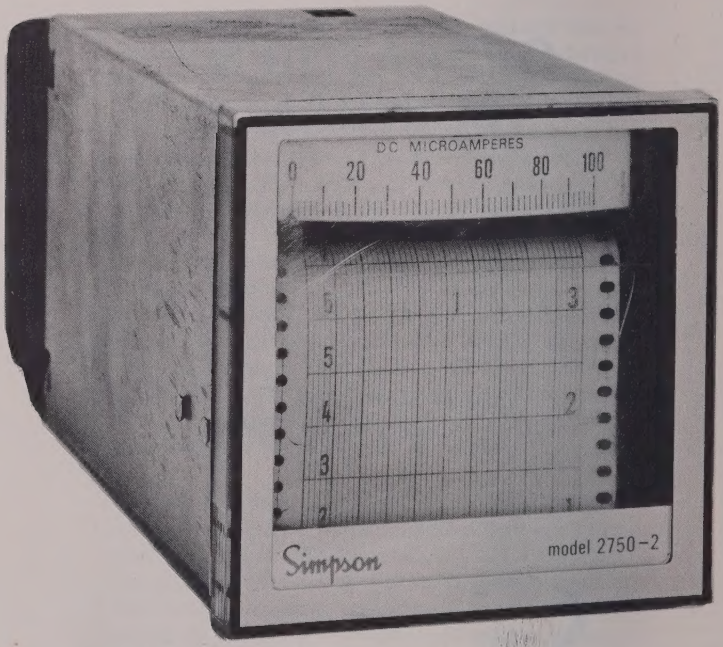

Figure 1-1. 2750-2 Strip Chart Recorder

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NOTE: This Operator's Manual contains information essential to the operation of this Instrument. Therefore, it should be kept in a convenient place and used for reference as required. (See "Notes For The Record," at the back of this manual.)

SAFETY SYMBOLS AND MARKINGS

Symbols and special markings are used in this manual and/or on the Instrument to call attention to possible hazards that may occur in the operation of the instrument. For personal protection, the operator must recognize the symbols and markings and observe the instructions to which they refer. These symbols and markings are defined below.

WARNING

This paragraph heading calls attention to a procedure, practice or the like which, if not correctly performed or adhered to, could result in personal injury.

CAUTION

This paragraph heading calls attention to a procedure practice or the like which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the instrument.

This symbol (a red lightning flash) calls attention to nearby parts at which a shock hazard may or does exist. These parts must not be touched while energized.

This symbol appears next to a protective grounding terminal which must be connected to earth ground before any other connections are made or the equipment operated.

This marking adjacent to a terminal, operating device or another marking instructs the operator to refer to an explanation in the operator's manual to avoid damage to the equipment or personal injury.

WARNING

This instrument is designed to prevent accidental shock to the operator when properly used. However, no engineering design can render safe any instrument which is used carelessly. Therefore, this manual must be read carefully and completely before making any measurements. Failure to follow directions can result in a serious or fatal accident.

SHOCK HAZARD: As defined in American National Standard, C39.5, Safety Requirements for Electrical & Electronic Measuring & Controlling Instrumentation, a shock hazard shall be considered to exist at any part involving a potential in excess of 30 volts rms (sine wave) or 42.4 volts DC or peak and where a leakage current from that part to ground exceeds 0.5 milliampere, when measured with an appropriate measuring instrument defined in Section 11.6.1 of ANSI C39.5.

NOTE: The proper measuring instrument for the measurement of leakage current consists essentially of a network of a 1500 ohm non-inductive resistor shunted by a 0.15 microfarad capacitor connected between the terminals of the measuring instrument. The leakage curent is that portion of the current that flows through the resistor. The Simpson Model 229-Series 2 AC Leakage Current Tester meets the ANSI C39.5 requirements for the measurement of AC leakage current and can be used for this purpose. To measure DC Leakage current, connect a 1500 ohm non-inductive resistor in series with a Simpson 0-500 DC microammeter and use this as the measuring instrument.

SECTION I
INTRODUCTION

1.1 GENERAL

1.1.1 The Simpson 2750-2 (hereafter referred to as the 2750-2 or the Instrument) is a compact panel-mounted clamping-type strip chart recorder, which provides a recording by making a series of sequential impressions on pressure-sensitive chart paper.

1.1.2 The measured input to the pivot and jewel meter movement is converted to proportional pointer positions on the meter scale above the chart paper. Every 12, 6 or 2 seconds, depending upon the selected speed, a chopper bar momentarily clamps the pointer against the pressure sensitive chart paper. This produces a black dot. The chart paper is simultaneously advanced by the chopper bar ratchet and the black dots combine to form an apparent continuous line or curve, following changes in the input. The movement pointer is free to follow input changes at all times other than during the momentary clamping period.

1.1.3 The specially formulated chart paper produces a clean, clear trace and does not smudge, fog or blur with age. This system eliminates clogging, skipping and blotting problems associated with ordinary pen and ink recording systems.

1.1.4 The 2750-2 is available either as an A.C., 60 Hz line powered Instrument (50 Hz units are available on special order) or as a D.C. powered Instrument. The DC powered Instrument operates from an external 7-15 V DC source or can be operated from internal 9 V batteries. Accessory adapters are available to operate the DC units from 24 V or 48 V DC sources. Operation from internal batteries may be found useful where common-mode problems exist.

1.1.5 The recorder chassis slides out of the front of the unit (after the plastic cover is removed). As it does so, all external circuits are automatically disconnected from the chassis by an internal connector block. This assures protection against electric shock while servicing the chassis and eliminates the need for operator access to the rear panel connections and shock hazards that may exist behind the panel. All normal maintenance work such as zero adjustment of the meter, replacement of chart paper or changing of chart speed can be performed by partial withdrawal or removal of the chassis from the front of the panel.

1.1.6 The 2750-2 is intended for panel mounting in an enclosure that makes the rear panel connections inaccessible to the operator and with the rear panel protective grounding screw marked ⏚ solidly connected to earth ground. These requirements are necessary for the protection of the operator against electric shock and must be observed.

1.1.7 24 V OR 48 V DC ADAPTERS

Accessory adapters are available to enable operating the DC powered 2750-2 from 24 V or 48 V DC sources. An adapter consists of a resistive voltage divider with a capacitor across the output. The capacitor serves to stabilize the output voltage of the adapter by providing the momentary surge current required to operate the clamping bar relay. Refer to Fig. 2-5 for circuit details and Table 1-3 for catalog numbers of the adapters.

1.1.8 The 2750-2 can be made available with a case extender that provides room for an amplifier input circuit for low current ranges or for expanded scale voltmeter circuits. Refer to Fig. 1-2 and Table 1-3 for catalog numbers and ranges available.

1.2 SAFETY CONSIDERATIONS

This Operator's Manual contains special caution and warning headings which alert the user to hazardous operating and servicing conditions. These CAUTION or WARNING headings appear throughout this publication, where applicable, and are defined at the front of the manual under SAFETY SYMBOLS. To ensure the safety of operating and servicing personnel and to retain the operating performance of this Instrument, these instructions must be adhered to.

1.3 TECHNICAL DATA

Table 1-1 lists the Technical Specifications for the 2750-2.

TABLE 1-1. TECHNICAL DATA

1. MOVEMENT:

TYPE:	Pivot and jewel
RESPONSE TIME:	< 2 seconds
SCALE LENGTH:	60 mm

2. CHART PAPER:

TYPE:	Pressure sensitive, hard wax coating
LENGTH:	16 meters (52 ft.)
WIDTH:	2.75″ (70 mm)
RECORDING WIDTH:	2.16″ (55 mm)

3. CHART SPEEDS & CAPACITY: (60 mm/h is standard)

CAM (AC UNITS) or JUMPER (DC UNITS)	CHART SPEED mm/h	CHART SPEED in./h	CHART SPEED Scale divisions	CHART IMPRESSION RATE	CHART CAPACITY Hours	CHART CAPACITY Days
10 mm/h	10	.39	1/h	5/min	1600	66
20 mm/h	20	.79	2/h	10/min	800	33
60 mm/h	60	2.36	6/h	30/min	266	11

4. CHART, TIME MARKINGS (1-24h):

CHART SPEED	MARKING
10 mm/h	on left side of chart
20 mm/h	on right side of chart
60 mm/h	in center of chart

5. 30 mm INDEX MARK:

CHART SPEED	IMPRESSION OCCURRED
10 mm/h	3 h before index mark
20 mm/h	1½ h before index mark
60 mm/h	½ h before index mark

6. RECORDING ACCURACY: ±1.5% of F.S.

7. TEMPERATURE:

OPERATING:	32 to 104°F (0° to 40°C)
REFERENCE:	73.4°F ±1°F (23°C) at 30-60% R.H.

8. POWER REQUIREMENTS:

AC POWERED UNITS: 120/240 V ±10%, 60 Hz, 1.6/3.2 VA

DC POWERED UNITS: 7-15 V DC external supply, 9 V internal battery or 24 or 48 V DC external supply with accessory adapters

NOTE: 120/240 V, 50 Hz units available on special order.

9. MAX. RATED CIRCUIT-TO-GROUND VOLTAGE:*

All units with case grounded: 250 V rms or 350 V DC.

10. DIMENSIONS:

FRONT PANEL..... 3.78 x 3.78″ (96 m x 96 mm)
OVERALL DEPTH
(INCL. TERMINALS)..... 7.5″ (19.0 cm)
DEPTH BEHIND PANEL
(INCL. TERMINALS) .... 7.1″ (18.0 cm)
PANEL OPENING
REQUIRED ..... 3.62 x 3.62″ (92 mm x 92 mm)

11. WEIGHT ..... 2.9 lbs. (1.3 kg)

12. REAR PANEL TERMINALS ..... Male quick-connect, ¼″ tab

TABLE 1-2. ACCESSORIES FURNISHED WITH THIS INSTRUMENT

QUANTITY	ITEM	CATALOG
2	Rolls of chart paper	22155 or 22156, as applicable. Refer to Table 1-3.
1 set (of 3)	Chart speed cams (AC line operated units only) one cam installed in unit.	(See Table 7-1)

TABLE 1-3. CHART PAPER AND ADAPTER CATALOG NO.

ITEM	CATALOG NO.
Chart paper roll**, 50 Divisions wide	22155
Chart paper roll**, 30 Divisions wide	22156
48 V adapter for DC powered units	22150
24 V adapter for DC powered units	22151
BATTERIES (DC POWERED UNITS)	
9 V Neda 1604 A, Alkaline (2 required)	Readily available in local stores

*The maximum voltage, with respect to earth ground, which may be safely applied to the circuits of the Instrument.

**Special, hard wax coating, 16 m long, 70 mm wide

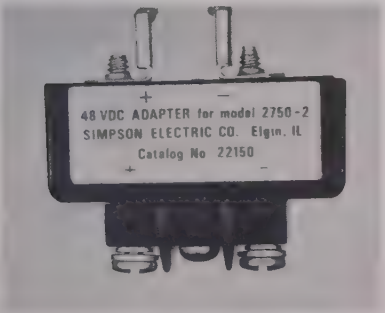


Fig. 1-2. 2750-2 24 and 48 V DC Adapter

TABLE 1-4. EXTENDED RANGES AVAILABLE

RANGE	CATALOG NO.
0-10 DC μA	D22130
0-50 DC μA	D22131
0-100 DC μA	D22132
100-130 AC V	D22143

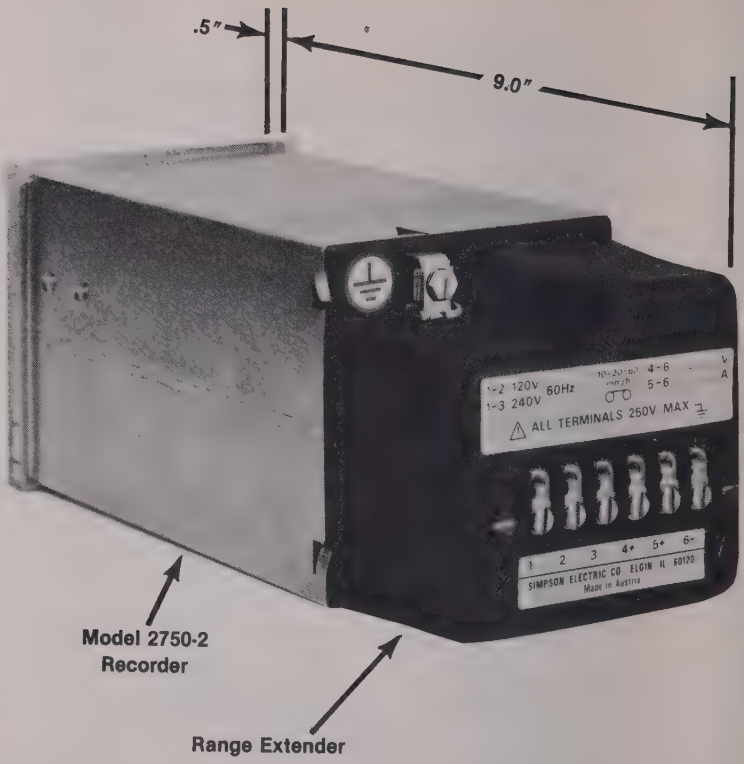


Fig. 1-3. 2750-2 With Range Extender (Rear View)

SECTION II
INSTALLATION

2.1 GENERAL

2.1.1 This section contains instructions for the receiving and installation of the 2750-2. Included are unpacking, inspection, warranty and shipping procedures, power source requirements and installation instructions.

2.2 UNPACKING AND INSPECTION

2.2.1 Examine the shipping carton for obvious signs of damage. Inspect the Instrument for possible damage incurred during shipment. If damage is noted, notify the carrier and supplier and do not use the Instrument. If Instrument appears to be in good condition, read Operator's Manual in its entirety. Become familiar with the Instrument as instructed in the manual, then proceed to check the electrical performance as soon as possible. Also, check that all items are included with the Instrument (Table 1-2 or 1-3).

2.2.2 Save the shipping carton and packing materials for future storing or shipping of the Instrument.

2.3 WARRANTY

2.3.1 The Simpson Electric Company warranty policy is printed on the inside front cover of this manual. Read it carefully prior to requesting a warranty repair.

NOTE: For assistance of any kind, including help with the Instrument under warranty, contact the nearest Authorized Service Center for instructions (listed on the last pages of this manual). If it is necessary to contact the factory directly, give full details of any difficulty and include the Instrument model number, serial number and date of purchase. Service data will be mailed promptly. If an estimate of charges for non-warranty or other service work is required, a maximum charge estimate will be quoted. This charge will not be exceeded without prior approval. (As an added convenience a record sheet has been included with this manual for noting all repair and servicing functions. See the back of this manual.)

2.4 SHIPPING

2.4.1 Pack the Instrument carefully and ship it prepaid and insured to the proper destination.

2.5 INSTALLATION

WARNING

This instrument is intended for panel mounting in an enclosure that makes the rear panel connections inaccessible to the operator and with the rear panel protective grounding screw marked ⏚ solidly connected to earth ground. The unit is not to be operated until so enclosed and grounded.

2.5.1 The 2750-2 is designed to be installed in a vertical panel (front cover vertical, chassis horizontal). This position ensures proper functioning and accuracy of the recording mechanism.

2.5.2 Dimensional diagram

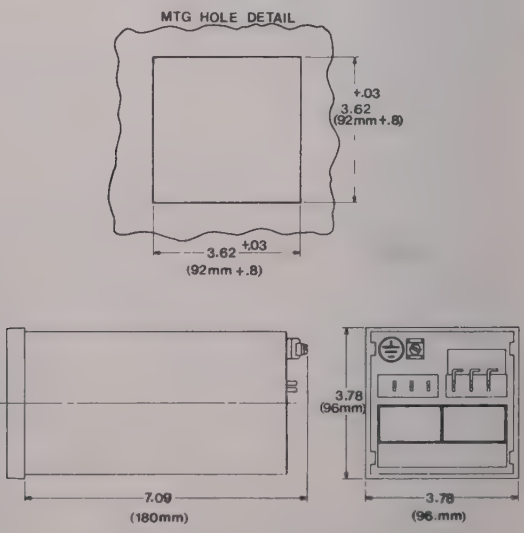
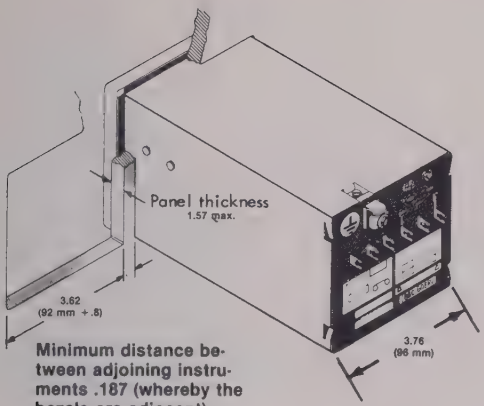


Fig. 2-1. Dimensional Diagram

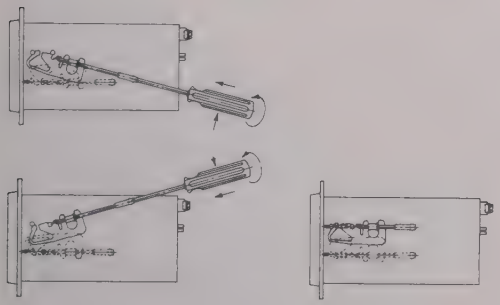


Minimum distance between adjoining instruments .187 (whereby the bezels are adjacent)

Fig. 2-2. Installing 2750-2 Into Panel

CAUTION

Do not twist the case when installing it within the panel. Inadvertent twisting can cause the meter clamping bar to bind.



Place fastener around the back cones, push fastener over front, and screw firmly against the panel.

Fig. 2-3. Installation of Mounting Bracket

2.5.3 Place recorder into position in the panel cut-out.

2.5.4 Attach the mounting brackets (1 ea. left and right side) to the mounting cones on both sides of the recorder. Holding the flat side of the bracket against the case beneath the cones and with notches upward and screwdriver slot toward rear, slide the center notch under the rim of the rear cone. Refer to Fig. 2-2. Holding the bracket firmly against the rear cone, rotate the bracket until the front cone snaps into the notch at the front end of the bracket.

2.5.5 Insert a 3/16″ flat-blade screwdriver into the fittings at the rear end of the screws and tighten the screws against the panel to secure the recorder.

2.6 POWER SOURCE REQUIREMENTS

2.6.1 AC LINE POWERED UNITS. These units may be operated either from 120 V AC or 240 V AC by proper selection of terminals on the rear of the case.

OPERATING VOLTAGE	VA
120 V AC	1.6
240 V AC	3.2

2.6.2 DC POWERED UNITS. These units may be operated from an external source of 7-15 V DC, from an external source of 24 V or 48 V DC by means of adapters (see para. 1.1.7), or from internal 9 V batteries (two in parallel). The source of supply for 7-15 V DC operation must be capable of delivering the momentary surge current required for recording (clamping). The 24 V and 48 V adapters utilize a capacitor to reduce the surge load on the supply.

TABLE 2-1. OPERATING CURRENT

OPERATING VOLTAGE	MEASURING (Steady)	RECORDING (Momentary)
7-15 V DC	.1 - .8 mA	150-270 mA
24 V DC (adapter)	17 mA	22 mA
48 V DC (adapter)	17 mA	19 mA
Internal 9 V battery	.14 mA	160 mA

2.6.3 ELECTRICAL CONNECTIONS

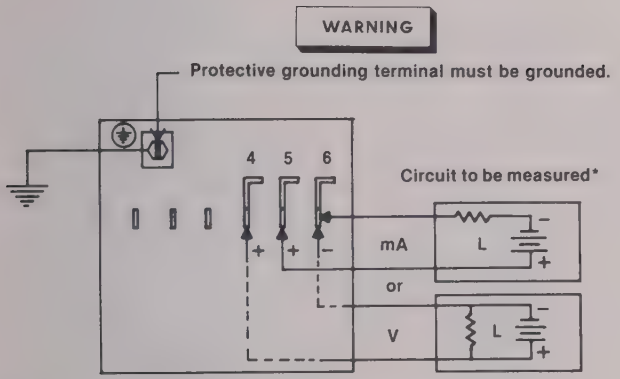


Fig. 2-4. Measuring Connections for All Units.

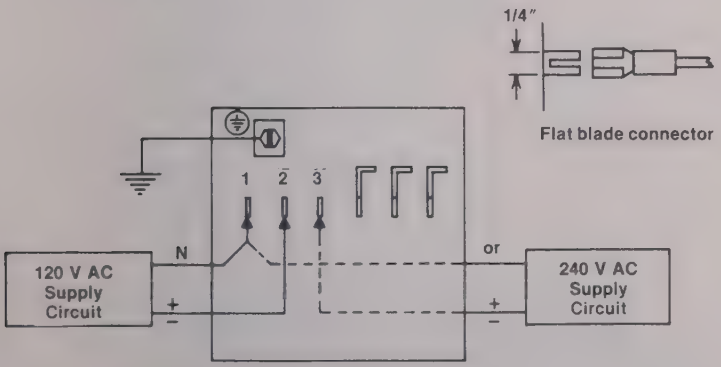


Fig. 2-5. AC Powered (External Supply)

* ! ALL TERMINALS 250 V MAX

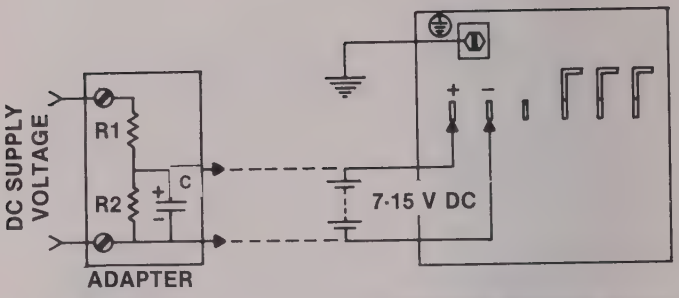


Fig. 2-6. DC Powered Unit (External Supply)

TABLE 2-2. ADAPTER DATA

Catalog No.	Supply Volts	R1	R2	C
22150	48 V	2.21 KΩ	700 Ω	475 μF 25 V
22151	24 V	760 Ω		

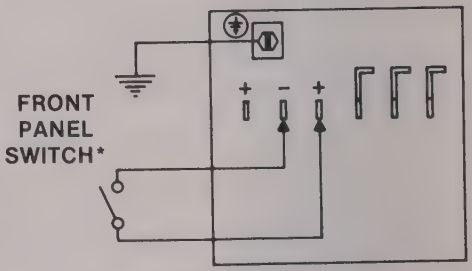


Fig. 2-7. DC Powered Unit (Internal Battery Supply)

WARNING

*When operating from internal 9 V batteries, the jumper must be connected or disconnected to start or stop the recorder. To do this, access to the interior of the enclosure (behind the panel) is required. Shock hazards may exist within the enclosure. To avoid electric shock to the operator, a front panel mounted switch in series with the jumper (Fig. 2-6) should be provided to permit the operator to start and stop the recorder.

SECTION III
CONTROLS AND INDICATORS

3.1 GENERAL: All components required to operate the recorder are identified and described in Table 3-1. Become thoroughly familiar with them before attempting to operate the recorder.

TABLE 3-1. CONTROLS AND INDICATORS

Fig.		
3-1	**Front Panel, Cover Removed**	
	1. Time mark 30 :	This mark, adjacent to the chart on both sides, is located 30 mm (3 scale divisions on the chart) from the point at which the impressions are being made on the chart.
	2. Front cover:	The transparent cover permits viewing the recorder chart while protecting the mechanism from dust and damage.
	3. Cover removing grips:	The fluted area is the gripping area for removal of the cover.
	4. Locking lever:	This lever, when moved to the right, allows the chassis to be pulled out far enough for chart servicing.
	5. Panel mounting cones:	The panel mounting brackets attach to these cones to hold the recorder to the panel.
3-2	**Chassis Withdrawn to Stop, Right Side**	
	6. Meter zero adjust screw:	This screw is used for mechanical zero adjustment of the meter pointer.

Fig.

7. Interlock release lever:	This lever stops the chassis from being completely removed. The chassis may be removed by inserting a pointed object into the slot and lifting the lever to release the chassis.

3-3 Chassis Withdrawn, Chart Drive Mechanism Opened

8. Battery Compartment (DC powered units):	Compartment for two 9 V batteries for self-contained power source.
9. Pointer and meter scale:	The pointer indicates the instantaneous value of voltage or current at the measuring terminals on the meter scale.
10. Finger grips:	The grips provide convenient means of pulling the chassis from the case.
11. Chart supply roll:	The chart supply roll stores in a compartment behind the take-up spool 6 .
12. Chart paper guide roller:	Provides the tension required to hold the chart paper perforations securely to the chart drive roller.
13. Chart drive roller:	The roller engages the perforations along the edge of the chart paper and advances the chart by gearing from the chopper bar ratchet gear.
14. Chart paper perforations:	The perforations on the left side of the chart are fitted over teeth on the chart drive roller to advance the chart.
15. Finger grips:	These grips are used to release and swing down the chart mechanism for chart replacement.
16. Take-up spool:	This spool is belt driven from the chart drive roller to store the used chart paper.

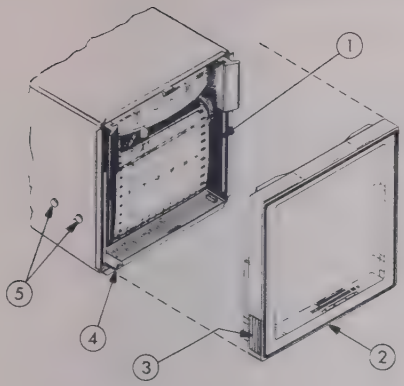


Fig. 3-1.
Front Panel,
Cover Removed

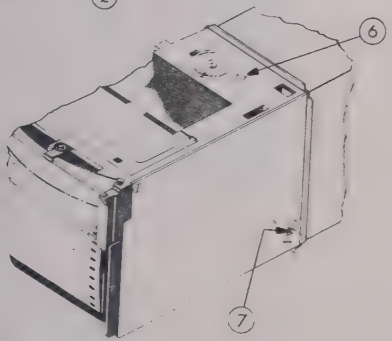


Fig. 3-2.
Chassis Withdrawn
to Stop, Right Side

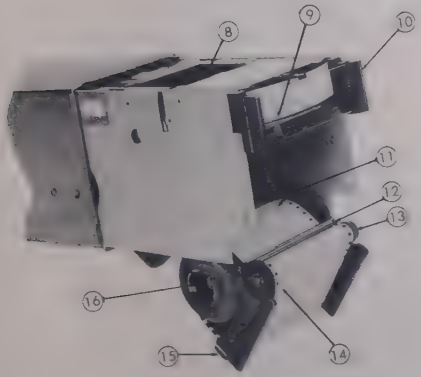


Fig. 3-3.
Chassis Withdrawn,
Chart Drive Mechanism
Opened

Fig.

3-4 Rear Panel (AC Line powered unit shown)

17. Protective grounding terminal:	This terminal is connected to earth ground for protection against electric shock.
18. Measuring terminals:	These terminals are connected to the circuit to be measured.
19. Power input terminals:	These terminals are connected to the source of power required to operate the recording mechanism.

3-5 Chart Speed Cam (AC powered units)

20. Cam retaining nut:	This nut is removed to change cams.
21. Chart speed cam (AC line powered units):	The number of tabs on this cam sets the chart speed and impression rate.

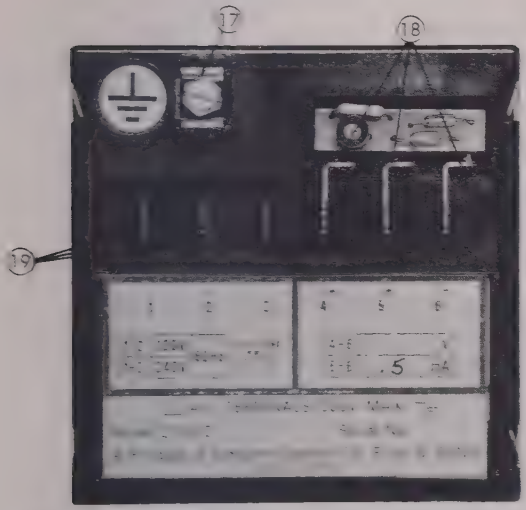


Fig. 3-4. Rear Panel (AC Line Powered Unit Shown)

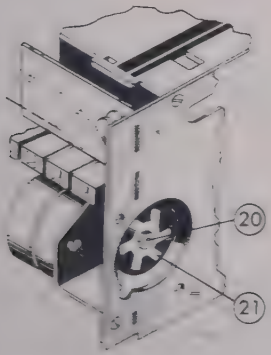


Fig. 3-5. Chart Speed Cam (AC Line Powered Units)

SECTION IV
OPERATION

4.1 GENERAL

4.1.1 This section of the manual provides instructions for the normal operation and maintenance of the 2750-2. Circled numbers in text refer to components described in Table 3-1 in Section III.

WARNING

Before proceeding with the operation of the 2750-2, review the Shock Hazard definition at the front of this manual.

4.2 SAFETY PRECAUTIONS

4.2.1 This section of the manual contains all the information related to the operation of the 2750-2. Special notes and instructions have also been provided for added safety and convenience.

WARNING

Ground the instrument case before connecting to powerline. This connection must be made using the ground screw terminal (7) (Figure 3-2) securely connected to an earth (powerline) ground.

4.3 REMOVAL OF UNIT FOR CHASSIS ACCESS

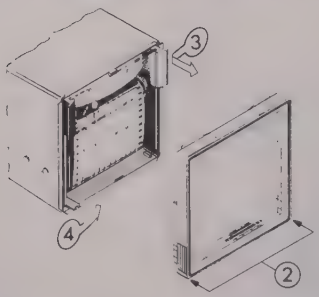


Fig. 4-1. Cover Removed

1. Grasp fluted areas at bottom of cover 2 and pull outward to unlatch cover. Disengage retaining ears from top of case and remove cover.
2. Hold locking lever 4 to the right to release the chassis.
3. Grasp the finger grips 3 on either side of the metal scale and pull chassis out until it latches in the fully withdrawn position.

4. To close the unit, move the locking lever 4 to the right to release the latch and push the chassis fully in until the latch is heard to re-engage.
5. Position the ears at the top of the cover between the case and the top of the meter scale and push inward at the bottom of the cover until it snaps into place.

4.4 REMOVAL OF CHASSIS FROM CASE

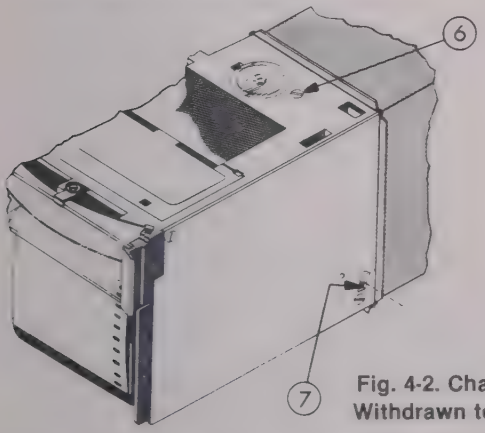


Fig. 4-2. Chassis Withdrawn to Stop

1. Withdraw chassis from case in accordance with steps 1 thru 3 in paragraph 4.1 above.
2. The chassis interlock 7 lever can be seen behind the slot on the right side of the chassis.
3. Insert a pointed object into the bottom of the slot (Fig. 4-2) and lift the lever to release the interlock while pulling outward on the chassis assembly.
4. To replace the chassis into the case, hold it in the proper position and push it in. It will immediately latch at the fully withdrawn position.
5. To replace cover, grasp fluted area at bottom of cover and push inward to latch the cover.

4.5 INSTALLING OR REPLACING CHARTS

1. (Refer to Fig. 3-3.)
2. Withdraw the chassis in accordance with instructions in paragraph 4.2.
3. Grasp the grips 15 , squeeze them to unlatch the drive mechanism and pull downward.
4. Remove the empty cardboard reel, if any, and place the chart roll into the compartment 11 with the round perforations to the left.
5. Pass the end of the chart paper under the guide roller 12 and pull out about 8″ of paper.
6. Position the round perforations over the drive roller 13 teeth, pass the chart down past the viewing area and insert the remaining chart between the two blades of the take-up spool 16 . Enough chart must protrude beyond the take-up spool to fold back over one blade to secure the chart to the spool.
7. Rotate the chart drive spool gear to move the chart downward until certain that the take-up spool has secured the end of the chart and the chart paper is stretched taut.
8. Continue rotating the chart drive spool until the appropriate time marking (left, center or right side of the chart) is aligned with the chart impression point. The impression point is not visible with the unit closed nor can it be accurately located with the chart drive mechanism open. The impression point can be located by means of the "30" time mark 5 , index line. Refer to paragraph 4.7. The index line on either side of the chart viewing area is located 30 mm from the impression point which is equivalent to 1/2 hour (@ 60 mm/h), 1-1/2 hour (@ 20 mm/h), or 3 hours (@ 10 mm/h).
9. Tilt the chart drive unit upward until it latches in place and push the chassis back into the case (paragraph 4.2) to begin recording.

4.6 MECHANICAL ZERO ADJUSTMENT

1. To check mechanical zero of the meter movement, withdraw the chassis from the case (paragraph 4.2). This will deenergize the circuit.

2. Note whether the meter pointer 9 indicates exactly zero on the meter scale. If it does, re-close the unit. If not, proceed as follows.
3. Locate the white-plastic adjusting screw 6 on the top of the chassis toward the rear.
4. Rotate this screw slightly in either direction as required to move the pointer to zero while gently tapping the top of the chassis to eliminate hysteresis effects.
5. Re-close the unit (paragraph 4.2).

4.7 CHANGING CHART SPEED

4.7.1 All Units: Remove the chassis from the case (paragraph 4.2 and 4.3).

4.7.2 AC Line Powered Units

1. Remove the plastic nut 20 which secures the chart drive cam 21 (60 mm/h) and lift off the cam. (Refer to Fig. 3-5)
2. Place new cam (10 or 20 mm/h) over shaft with the arrow facing outward and the index hole fitted to the index pin on the shaft hub. The clamping bar lever may have to be held out of the way while fitting the cam. Do not attempt to rotate the motor shaft.
3. Replace and tighten the platic nut. Avoid excessive force.
4. Replace unit into case (paragraph 4.2 and 4.3).

4.7.3 DC Powered Units

1. Locate the three pins marked 10, 20, 60 on the rear-of-chassis circuit board just below the terminal strip. A short jumper lead is connected to one of the pins.
2. Disconnect the jumper from its pin and reconnect it to the pin that provides the desired chart speed (10, 20 or 60 mm/h).
3. Replace unit into its case (paragraph 4.2 and 4.3).

4.8 READING THE CHART

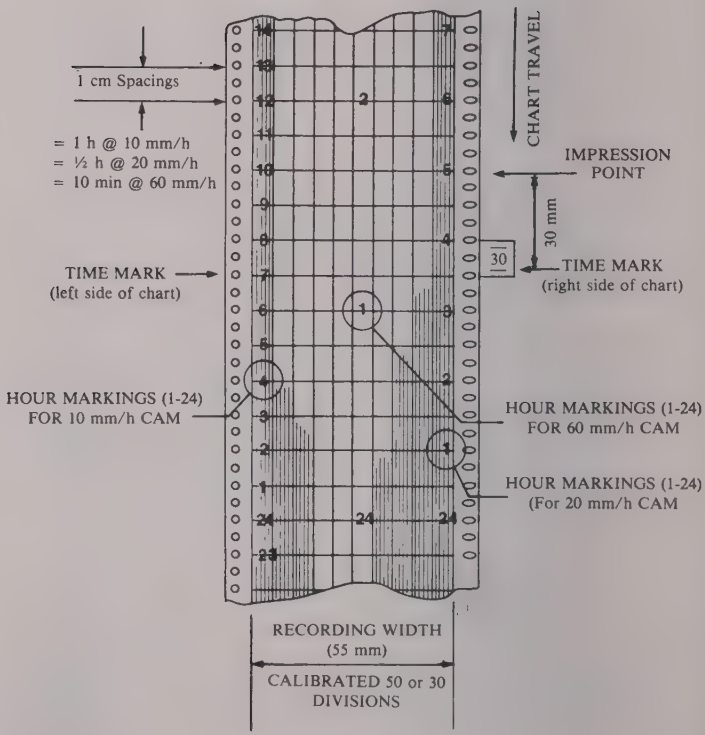


FIG. 4-3. Chart Paper

SECTION V
THEORY OF OPERATION

5.1 GENERAL

5.1.1 Rear panel terminals pass directly through the case to an internal connector which serves to deenergize all internal circuitry when the recorder chassis is withdrawn from the front of the case. This eliminates any shock hazard to the operator while performing maintenance functions.

5.2 MEASURING SYSTEM

5.2.1 The parameter to be measured connects to a circuit board at the rear of the recorder chassis where it is modified as required to match the characteristics of the meter movement (range and function).

5.2.2 A red arrow at the end of the meter pointer indicates the instantaneous deflection of the pointer on the calibrated meter scale. The pointer shaft passes over the chart paper directly above the chart drive roller where periodically it is pressed down against the special wax-coated chart by the clamping bar to make an impression on the chart.

5.3 CHART DRIVE SYSTEM

5.3.1 AC Line Powered Units: A special notched cam attached to the shaft of a synchronous electric motor moves a lever system which moves the clamping bar down to press the meter pointer against the chart paper. A ratchet pawl attached to the lever simultaneously rotates a ratchet gear by one tooth. The ratchet gear drives the chart drive roller through a gear train to advance the chart slightly each time an impression is made. The chart drive roller is belted to the take-up spool which stores the used-up chart.

5.3.2 DC Powered Units: The DC powered units are not motor driven. The clamping bar is operated by means of an electromechanical relay. The impression rate is provided by a quartz controlled oscillator and frequency divider which produces a selectable pulse rate. The pulse rate selected determines the chart speed and impression rate. At each pulse, the relay presses the chopper bar against the meter pointer to record a dot on the chart and also advance the chart.

The DC units will operate satisfactorily over a supply voltage range of 7-15 V. Adapters to operate the units from 24 or 48 V DC supplies are available as accessories.

With internal 9 V battery operation, the two 9 V batteries are in parallel and provide sufficient recording time for one chart roll.

5.4 CHART PAPER

5.4.1 The chart paper consists of a specially formulated, white, hard-wax coating over a black paper roll. As the meter pointer is pressed against the curved surface of the chart, the white coating is displaced to permit the black background to show through as a black dot. The chart trace consists of a series of closely spaced black dots which appear as a continuous line or curve. The wax chart system eliminates the many maintenance problems inherent with inking pen systems. (See Fig. 4-3)

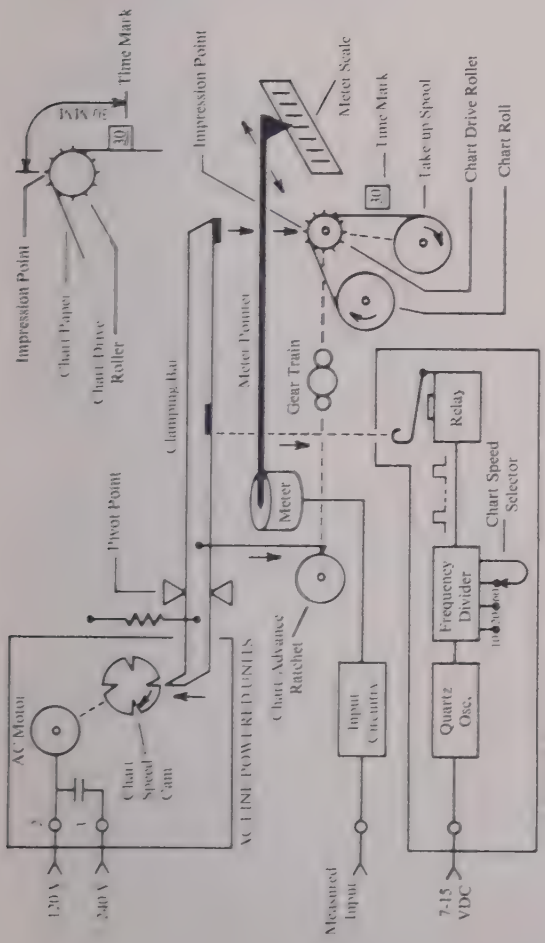


Fig. 5-1. System Functional Diagram

SECTION VI
OPERATOR MAINTENANCE

6.1 GENERAL: Operator maintenance of the 2750-2 minimal. Other than routine changing of chart rolls, maintenance may call for occasional brushing-out of accumulated wax particles from the case and/or cleaning the front cover. Any requirements beyond these should be referred to qualified service personnel (refer to Section VI).

WARNING

With the recorder chassis completely removed, the terminal pins inside the case at the rear are accessible and a shock hazard may exist. Before attempting to reach inside the case with hand or tool, make certain that all power sources to the equipment have been deenergized.

6.2 CLEANING THE FRONT COVER. Wash the cover in mild detergent-water mixture, rinse in clean water and dry carefully with a soft cloth to avoid scratching the viewing area. Do not use chemical solvents on plastic parts.

6.3 ANNUAL CARE. It is recommended that the Instrument be returned to the nearest Authorized Service Center (listing on back pages of this manual) at least once yearly (sooner, if required) for a complete check-up, adjustment and calibration.

6.4 STORAGE. Instruments removed from service should be stored in their original shipping container for protection. Instruments should be stored in a location free of temperature and humidity extremes, dust, corrosive fumes, vibration or shock.

Remove internal batteries, if any, if storage time may exceed 30 days.

WARNING

The following servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

SECTION VII
SERVICING INSTRUCTIONS

7.1 GENERAL

It is important to the performance of the Instrument and to the safety of the operator that repair work is performed properly using the correct replacement parts. For this reason all servicing other than as described in the operating instructions must be performed by qualified service personnel. It is recommended that any such servicing be referred to an Authorized Service Center (See listing following this section.)

7.2 REPLACEMENT PARTS

Table 7-1 lists those replacement parts most likely to be required in the operation of the unit and which may be replaced by the operator. For parts not listed herein, contact your nearest Authorized Service Center or the factory Service Department in Elgin, Illinois.

Table 7-1 Replacement Parts

Description	Part No.
Chart Speed Cam, 60 mm/h	GO-001085
Chart Speed Cam, 20 mm/h	GO-001071
Chart Speed Cam, 10 mm/h	GO-001070
Nylon Nut	GO-001120
Plastic Front Cover	GO-001087

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SIMPSON ELECTRIC COMPANY

853 Dundee Avenue, Elgin, Illinois 60120 — Phone (312) 697-2260

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★★★ Same Service as (★★) Above Plus Panel Instrument Modification
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Tel. 602/243-4111

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Tel. 714/979-1420

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Tel. 305/843-6770

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Tel. 305/725-8300

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Tel. 813/870-0183

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3020 Commerce Way
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P. O. Box 595 (Mail)
Hiway 287 West (UPS)
Tel: 307/332-9711

NOTES

FOR THE RECORD

Date Purchased _____

Purchased From: _____

Identification Number: _____

Date	*Type of Service*	*Serviced By*
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

NOTES

FOR THE RECORD

Date Purchased _____

Purchased From: _____

Identification Number: _____

_____

Date	*Type of Service*	*Serviced By*
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

NOTES

FOR THE RECORD

Date Purchased _____

Purchased From: _____

Identification Number: _____

_____

Date	*Type of Service*	*Serviced By*
____	_____	_____
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Quality is the indispensable component
of every Simpson instrument.....